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PROBLEM OF THE PATHOGENESIS OF POISONING BY TETRAETHYL LEAD

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The authors conducted a study of cases poisoned by tetraethyl lead either by inhalation of vapors or through the digestive tract. Those in the first group indicated rapid reaction, and the basic symptoms were insomnia, hypnagogic hallucinations, incubus, symptoms of fear and excitement to the point of acute delirium, and collapse before death. Those in the second group indicated syndromes differing according to their individual constitutional peculiarities, age, etc., (for instance, prevalence of euphoria or hypochondria). Both groups indicated predominantly a parasympathomimetic background. The blood pressure was very low even in convalescents. Cerebral hypertonia as well as general hypertonia were observed; the ratio of the pressure in the temporal artery and the humoral artery was 0.8-1.14 instead of the usual 0.5.

The authors maintained that the difference in the course of the poisoning in the two groups was due to the fact that the poison was absorbed at a slower rate from the digestive tract and that it was rendered less harmful by the liver. When inhaled, a greater quantity of the poison is absorbed at one time and does not permit the liver to detoxicate the poison. A study of the blood indicated that cholinesterase was considerably reduced, and acetylcholine was found in all the cases. Although the reduction of cholinesterase can contribute to the presence of acetylcholine, this does not always hold true. Therefore, it was necessary to look for other causes of acetylcholinemia. The hepatopathic condition of these cases can be the cause of acetylcholinemia because it results in the insufficient elimination of acetylcholine by this organ. Finally, there is reason to believe that the poison directly affects the synapse, thus disrupting the ratio of formation of acetylcholine and cholinesterase. The surplus of acetylcholine apparently determines the parasympathomimetic background of the intoxication.

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The present report does not give an exhaustive coverage of the disruption of neuro-humoral processes during the poisoning by tetraethyl lead. However, the authors believe that this report does show that in the therapy of the above poisoning it is necessary not only to provide for the use of detoxicating agents, but also to take into consideration the matter of chemical decompensation which is directly concerned with the decrease in the cholinesterase.

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